Info-package 2

Building-integrated photovoltaics (BIPV), energy storage and smart grid management

Energy

BIPV, storage and smart grid management

Energy

Introduction

Description

This intervention involves the installation of photovoltaic (PV) panels and battery storage to four blocks of maisonettes / flats (94 dwellings in total).

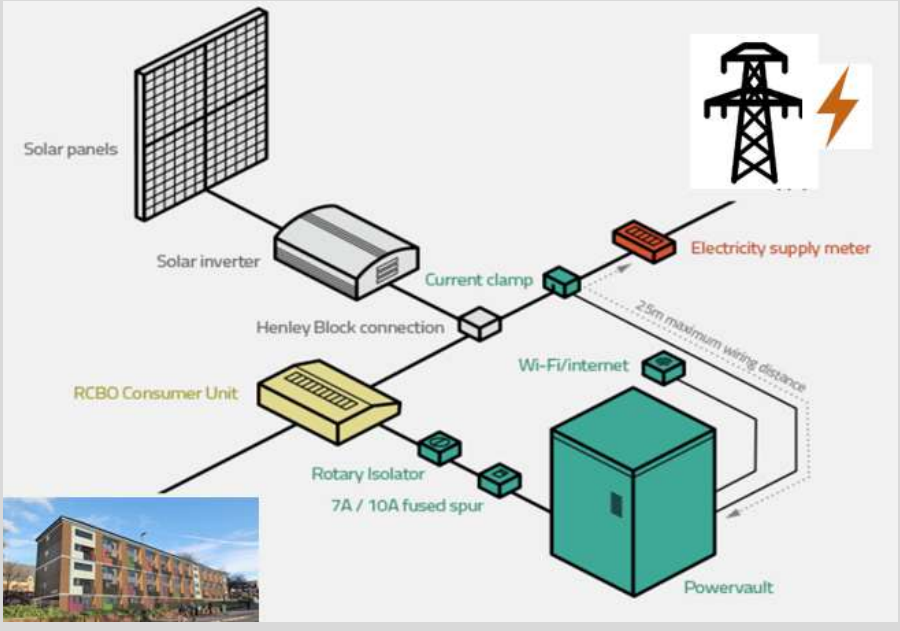
A ‘Reselling’ electricity supply model will also be implemented. This will mean buying grid electricity in bulk and reselling grid and PV electricity to tenants at a lower cost.

We are working with an Energy Services Company (ESCo) service provider to develop the systems and contracts for metering, billing and optimisation.

Optimisation of this system will involve:

- Maximising the proportion of PV electricity used on site
- Reducing electricity costs with time-of-use tariffs
- Minimising use-of-network charges by reducing peak demand; and
- Accessing additional ‘grid services’ revenues, where possible

Figure



This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 646511

BIPV, storage and smart grid management

Energy

Goals

- Cheaper energy bills for tenants and also a model for recovering some of the investment to facilitate further investment in other properties.
- Push forward innovation to capture some of the potential for 'smart' supply – facilitating lower bills and greater deployment potential for renewables.
- Explore 'next stage' opportunities for optimising the value for storage systems.

Specific steps…

- Install PV, battery storage and controls system.
- Develop and implement new supply model with robust metering and billing systems.
- Supply low cost electricity to residents.
- Optimise system to maximise own use of PV electricity and reduce peak demand.
- Build relationship with municipal electricity supplier to develop time of use tariffs and reduce use-of-network charges.
- Produce a sustainable financial model that can be replicated elsewhere.

Progress

Describe here the overall progress of the solution.

The system has been designed and options for equipment and controls explored. Solutions for metering and billing are well advanced. Solutions for optimisation are being explored. Approval from the Distribution Network Operator (DNO) for grid connection has been achieved. Residents have been approached and have shown positive interest in the project and opportunity for low cost electricity.

Extensive engagement work has been undertaken with the electricity supply regulatory bodies (ofgem and Elexon); and with operational stakeholders (especially Robin Hood Energy, SMS, and Western Power Distribution). This has been to work through structures and mechanisms for the electricity supply that are compliant with regulations and practicably deliverable.

A 150 kW (AC) / 174.9 kW (DC) PV system has been installed at the demo site. The PV system is installed on 11 building roofs as building integrated PV (BIPV) and on 4 carports. The generated electricity will be sold to the ESCo. In addition 8 12V 110Ah battery storage has been installed, connected as 48V 220Ah. This storage will be used mainly for powering outdoor lighting in case of an outage. The BIPV system received temporary acceptance and started to produce electricity on March 22nd. The integration of the PV system with the CoC is on-going.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 646511

Lessons learnt

01	The technology is ready to go but new market arrangements, service providers, contractual arrangements etc. all need development
02	There is interest and support from regulators for innovative supply models
03	Allowing residents to opt in and out of the supply model presents challenges for metering arrangements
04	Revenues from 'grid services' provided by battery storage are uncertain
05	Good relationship with DNO important to get approval for system of choice
06	The lead-time for PV panels can be very long. The order should be given well ahead of time to meet project milestones. If PV panels are imported, around 3-4 months should be added for customs process.
07	Project plan should also incorporate ESCo approval times, medium voltage cell lead times, as these can take a long time as well.
08	BIPV application on rooftops should be water resistant and leak-proof. This should be considered in product selection. In the Turkish demo site an innovative French solution has been used.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 646511

Produced for REMOURBAN by:

Philip James
Nottingham City Homes
Philip.james@nottinghamcityhomes.org.uk

Sinem Sarıçoban
Tepebaşı Municipality
sinem.saricoban@tepebasi.bel.tr

www.remourban.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 646511